

WHAT IS CLAIMED IS:

1. A wave antenna system comprising a plurality of spaced apart wave antennas, each wave antenna comprising:

a central dielectric portion having a first side and a second side opposite the first side;

a first dielectric taper portion having a first dielectric taper portion proximal side connected with the first side of the central dielectric portion and a first dielectric taper portion distal side; and

a second dielectric taper portion having a second dielectric taper portion proximal side connected with the second side of the central dielectric portion and a second dielectric taper portion distal side.

2. The system of claim 1, further comprising a plane supporting the plurality of wave antennas.

3. The system of claim 2, wherein the plane has a first plane side and a second plane side and the wave antennas are inserted in the plane, the first dielectric taper portion located above the first plane side, and the second dielectric taper portion located below the second plane side.

4. The system of claim 3, wherein the wave antennas are inserted in the plane perpendicularly to the plane.

5. The system of claim 3, wherein the wave antennas are disposed in an array configuration.

6. The system of claim 3, wherein the wave antennas are disposed in a substantially hexagonal configuration.

7. The system of claim 5, wherein the array configuration of wave antennas has a peripheral shape formed by distal portions of the first and second dielectric taper portions, the peripheral shape being lens-shaped.
8. The system of claim 7, wherein the peripheral shape is chosen from a group consisting of a double convex lens, a double concave lens, a plano-convex lens, and a plano-concave lens.
9. The system of claim 1, wherein at least one between the first dielectric taper portion and the second dielectric taper portion is bendable.
10. A wave antenna comprising:
a central dielectric portion, acting as a waveguide, having a first side and a second side opposite the first side;
a first dielectric taper portion connected with the first side of the central dielectric portion; and
a second dielectric taper portion connected with the second side of the central dielectric portion.
11. The antenna of claim 10, wherein at least one between the first dielectric taper portion and the second dielectric taper portion is bendable.
12. An array of wave antennas, each wave antenna comprising:
a central dielectric portion, acting as a waveguide, having a first side and a second side opposite the first side;
a first dielectric taper portion connected with the first side of the central dielectric portion; and
a second dielectric taper portion connected with the second side of the central dielectric portion,
wherein the central dielectric portions have a length, said length being variable among individual wave antennas, the array exhibiting a lens-shaped periphery by virtue of said variable length.

13. The array of claim 12, wherein the first and second dielectric taper portions have a length, the length of the first and second dielectric taper portions being the same along the array.

14. The array of claim 12, wherein at least one between the first taper portion and the second taper portion is bendable.

15. An array of wave antennas, each wave antenna comprising:

a central dielectric portion, acting as a waveguide, having a first side and a second side opposite the first side;

a first dielectric taper portion having a first dielectric taper proximate end connected with the first side of the central dielectric portion and a first dielectric taper distal end; and

a second dielectric taper portion having a second dielectric taper proximate end connected with the second side of the central dielectric portion and a second dielectric taper distal end,

wherein the distal ends of the first dielectric taper portions form a first surface of the array and the distal ends of the second taper portions form a second surface, and wherein incoming waves are captured by the first dielectric taper portions and re-emitted by the second taper portions.

16. The array of claim 15, wherein the first surface is selected from a group comprising a planar surface, a concave surface, or a convex surface, and the second surface is selected from a group comprising a planar surface, a concave surface, or a convex surface.

17. The array of claim 15, further comprising a plane, the plane being crossed by the wave antennas forming the array.

18. The array of claim 17, wherein the wave antennas are arranged in a substantially hexagonal configuration along the plane.

19. The array of claim 15, wherein at least one between the first dielectric taper portion and the second dielectric taper portion is bendable.

20. A wave antenna system comprising a plurality of spaced apart wave antennas, each wave antenna comprising:

- a central dielectric portion having a first side and a second side opposite the first side;

- a first dielectric taper portion having a first dielectric taper portion proximal side connected with the first side of the central dielectric portion and a first dielectric taper portion distal side, the first dielectric taper portion proximal side having a first dielectric taper proximal width, the first dielectric taper portion distal side having a first dielectric taper distal width, the first dielectric taper proximal width being greater than the first dielectric taper distal width; and

- a second dielectric taper portion having a second dielectric taper portion proximal side connected with the second side of the central dielectric portion and a second dielectric taper portion distal side, the second dielectric taper portion proximal side having a second dielectric taper proximal width, the second dielectric taper portion distal side having a second dielectric taper distal width, the second dielectric taper proximal width being greater than the second dielectric taper distal width.

21. A wave antenna comprising:

- a central dielectric portion, acting as a waveguide, having a first side and a second side opposite the first side;

- a first dielectric taper portion connected with the first side of the central dielectric portion, wherein a proximal thickness of the first dielectric taper portion proximal to the central dielectric portion is greater than a distal thickness of the first dielectric taper portion distal to the central dielectric portion; and

- a second dielectric taper portion connected with the second side of the central dielectric portion, wherein a proximal thickness of the second dielectric

taper portion proximal to the central dielectric portion is greater than a distal thickness of the second dielectric taper portion distal to the central dielectric portion.